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THE STATISTICAL DISCREPANCY IN THE U.S. INTERNATIONAL TRANSACTIONS ACCOUNTS: SOURCES AND SUGGESTED REMEDIES

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ABSTRACT

The statistical discrepancy in the U.S. international transactions accounts has tended to be both large and positive over the last decade and a half. In 1990 the statistical discrepancy rose by $45 billion to a record $64 billion and brought the cumulative discrepancy since 1960 to almost $250 billion. The size and persistence of this discrepancy has called into question the accuracy of the data on the U.S. current and capital accounts.

This paper attempts to find clues to the sources of the statistical discrepancy by 1) reviewing past history, 2) examining the data sources for each major component of the U.S. international transactions accounts, and 3) using regression analysis. The paper concludes with a list of recommendations for data improvements.

While inadequacies are evident in the data for a wide variety of international transactions, both current and capital account, the search for sources of the big increase in the discrepancy between 1989 and 1990 probably can be narrowed largely to the capital account. It seems unlikely that net exports of goods, services, or investment income increased by an additional $45 billion in 1990. On the capital account side, increases in foreign holdings of U.S. currency probably played a significant role, but the bulk of the increase in the statistical discrepancy in 1990 remains a mystery.
THE STATISTICAL DISCREPANCY IN THE U.S. INTERNATIONAL TRANSACTIONS ACCOUNTS: SOURCES AND SUGGESTED REMEDIES

Lois Stekler

I. INTRODUCTION

The statistical discrepancy in the U.S. international transactions accounts has tended to be both large and positive over the last decade and a half. In 1990 the statistical discrepancy reached a record $64 billion and the cumulative discrepancy since the beginning of 1960 summed to almost $250 billion. The size and persistence of this discrepancy has called into question the accuracy of the data on the U.S. current and capital accounts.

In principle, the sum of all transactions in the U.S. balance of payments accounts, a double-entry bookkeeping system, should equal zero; for each transaction there should be two equal entries of opposite sign. In practice, the recorded accounts never sum exactly to zero because the data that would reflect the debit and credit counterparts of each single transaction generally are obtained from different sources. The statistical discrepancy is the net of errors and omissions in all the components of the international transactions accounts. A positive statistical discrepancy represents some combination of net unrecorded

1. The author is a staff economist in the Division of International Finance. This paper reflects the views of the author and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System or other members of its staff. The author would like to acknowledge many helpful conversations with staff members at BEA, Treasury, the Federal Reserve Bank of New York, and the IMF Working Party on the Measurement of International Capital Flows. The author would also like to thank Allen Frankel, Bill Helkie, Sarah Holden, Peter Hooper, Russ Krueger, Walther Lederer, Kathy Morisse, and Larry Promisel for helpful comments on an earlier draft and Vladimir Gutin for his assistance.
capital flows data.

and Japan raises serious questions about the accuracy of the U.S.

transactions accounts with data from other sources (Federal Reserve, BIS,
data collection, comparison of data from the U.S. International

when it has been very difficult to get additional resources to devote to

tracking of international capital flows far more difficult, at a time

through which transactions occur. These developments have made the

both the number of participants in foreign markets and the channels

have contributed to the globalization of financial markets, multiplying

on the capital account side, innovation and technological change

abroad.

information on the assets or new instruments or their subsequent transfers

substantially understated. In addition, the United States has little

settlements (ķUS) suggest that U.S. portfolio investment income may be

with data reported by other countries to the Bank for International

about investment positions and rates of return; comparisons of U.S. data

portfolio investment income are estimates based on shaky assumptions

improved in recent years, but further progress is needed. U.S. data on

as they physically enter or leave the country, have been greatly
difficult to collect than data on goods (because they cannot be monitored

exports. Data on services transactions, which are generally more

site, customs data on imports are generally monitored more carefully than

both current and capital account transactions. On the current account

There are, undoubtedly, errors and omissions in the recording of

unreported capital inflows from abroad.

exports to foreigners of goods, services, and investment income and net
Inadequacies in the data on U.S. international transactions have produced both increased volatility in the statistical discrepancy in recent years and a tendency towards large positive values. The sources for these trends need not be the same. While timing problems and errors and omissions in the reporting of capital flows are more likely sources of the increases in short-term volatility, errors and omissions in the recording of current account transactions also have probably contributed to the upward trend in the discrepancy.

Part II of this paper reviews the past history of the statistical discrepancy for clues about its sources. Part III examines the data sources for each major component of the U.S. international accounts, points to problem areas, and suggests certain improvements. Part IV uses statistical tests to try to shed light on the sources of the statistical discrepancy and Part V summarizes the conclusions and suggestions for improving the data.

II. CLUES FROM PAST HISTORY

The growth of the statistical discrepancy in the U.S. international transactions accounts is a relatively recent development. In both the 1950's and the 1960's the statistical discrepancy was close to zero. (See chart 1.) In contrast, during the early 1970's there were substantial net unrecorded outflows or payments. Since 1974 the statistical discrepancy has tended to be both large and positive, indicating net unrecorded receipts or inflows. This increase in magnitude is not just the result of the inflation of nominal values. The ratio of the statistical discrepancy to the value of trade (the average of recorded exports and imports of goods, services, and investment
income) rose from a mean absolute value of .02 in the 1950's and 1960's to .05 in the 1970's and 1980's.²

The statistical discrepancy has increased not only in size, but also in volatility. Increases in the statistical discrepancy in one quarter, tend to be followed by decreases in the next quarter.³ The average absolute size of the quarterly changes in the statistical discrepancy, scaled by the value of trade, has risen from .04 in the 1960's, to .06 in the 1970's, and .09 in the 1980's.

In the early 1980's, it was assumed that the sudden increase in the positive discrepancy was largely accounted for by unrecorded capital flows. The wide quarterly swings in the size of the statistical discrepancy also supported that conclusion. It was recognized that errors and omissions occurred in the reporting of trade transactions, but there seemed little reason to assume that these errors would suddenly increase or that they would vary widely from quarter to quarter.

Previous periods of relatively large positive statistical discrepancies had coincided with unsettled political and economic conditions abroad. The ratio of the value of the statistical discrepancy to trade was about as high as or higher than the 1979-1980 levels (.08) in certain Depression years (1934, 1935, and 1937), the early years of World War II (1939-41), and 1948. It seemed reasonable to assume that these earlier episodes were associated with the flight of capital to a safe haven in the United States in forms that were not fully reported, either because these investors wanted to remain anonymous or because the

² The peak values for this ratio in the postwar period were .14 in 1971, .10 in 1982, and .09 in 1990.
³ A regression between changes in the statistical discrepancy in one quarter and changes in the previous quarter (1960Q2-1990Q4) produces an R2 of .28 and a statistically significant coefficient of -.53.
The persistence of positive net statistical discrepancies during unrecorded capital inflows in 1979 and 1980, although negative in 1987, was 1971. It was estimated that, even though the statistical discrepancy of positive transactions was relatively large, although negative, was 1971. It was estimated that the only other持有的 capital inflows to the accumulation of wealth in OPEC hands and the U.S. freeze of Iranian assets. During the 1978-1980 period, the second oil crisis, combined with rapid expectations of dollar depreciation plus certain capital export controls, led to unrecorded capital outflows in that year. The I. Persistence of positive net statistical discrepancies during unrecorded capital inflows in 1979 and 1980, although negative, was 1971. It was estimated that, even though the statistical discrepancy of positive transactions was relatively large, although negative, was 1971. It was estimated that the only other...
reader is referred to The Balance of Payments of the United States: Concepts, Data Sources, and Estimating Procedures, published by the Department of Commerce, Bureau of Economic Analysis, May 1990, for a detailed description of the accounts. This paper provides only an impressionistic survey, focusing on problem areas and particularly on capital flows and investment income, which have not been the focus of other recent studies of U.S. data adequacy. It should be noted that the statistical discrepancy is the net of all errors and omissions in the accounts; correction of some data inadequacies would add to the net statistical discrepancy rather than reduce it.

Before proceeding to discuss each of the components of the U.S. international transactions accounts, it would be useful to touch on certain general problems. One pervasive problem in the last decade has been the scarcity of resources devoted to the collection and improvement of data. Generally, staffs at Treasury, Commerce, and the Federal Reserve Bank of New York (FRBNY) are well aware of inadequacies in the international transactions data they collect or estimate, but resources have not been available to make substantial improvements. Preoccupation with reducing the Federal budget deficit and getting the government "off the backs" of the private sector has outweighed concerns about data adequacy and the potential for faulty policies based upon inadequate data. In some areas, automation has reduced the costs of data collection; data have been improved despite constant or even reduced

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5. The Panel on Foreign Trade Statistics of the National Academy of Sciences expects to release its report assessing the data on trade in goods and services during 1991.
6. In some cases planning is currently underway to correct some of the inadequacies discussed in this paper and requests for additional funding are included in current budget proposals.
This information should be allocated between Treasury and Commerce.

Another open question is how the costs of obtaining benchmark estimates are to be shared with holders of holdings to provide detailed information. In the Survey, Israel or whether other sources could be used in combination with detailed information on holdings to provide a more complete data set is included. The Survey is to include questions on income and interest and with the 1994 benchmark survey. It is not clear to me whether the best way to obtain this information is to include questions on interest and income. Treasury does plan to provide BPA with this information in connection with release of the Survey.

For balance of payments purposes (that is, when no supervisory purpose is served), the income of banks that would provide information on foreign service income solely on portfolio investments has not always been successful in corroborating the Federal Financial Institutions Examination Council's reports. Moreover, BFA investment abroad has been conducted since World War II, and at least since 1954. For example, the Foreign portfolio investment in the United States, Treasury did not provide BPA with information on income paid on foreign portfolio investment income. However, as part of the 1994 benchmark survey of the Treasury of holdings, a portfolio of benchmark estimates for BPA's portfolios of portfolio on portfolio capital flows. In addition, periodic benchmark surveys by the International Capital (ICC) reports are the source of data. The Treasury's data on international capital and cooperation occasionally breaks down. For example, differences between those who collect the data and those who use and analyze them; priorities differ frequently and cooperation occasionally breaks down. For example, new questions cannot be added to surveys unless other questions are dropped. The problems caused by inadequate funding and insuficiency that increase internationalization of the U.S. economy.

Collection of data has not kept pace with financial innovations and the increasing internationalization of the U.S. economy. Resources devoted to collection, however, in other areas, particularly capital flows and investment income, the resources devoted to data collection have not kept pace with financial innovations and the increasing internationalization of the U.S. economy.
Access to data across agencies also has been a problem. Confidentiality requirements preclude the wide sharing of micro data, but problems frequently arise even when data are supposed to be shared. For example, it was agreed in 1983 (after a decade of negotiations between the Federal Reserve Board and the Treasury) that the Federal Reserve Board was entitled to have access to banks' TIC reports. While information is currently supplied on a special request basis, we are still working to establish on-line access for the Federal Reserve Board to the micro data (which is stored on the FRBNY's computer). Another example of problems with data access across agencies was dealt with by Congressional legislation in 1990. This legislation allows BEA access to the data provided to Census by the establishments owned by foreign direct investors in the United States. Implementation of this legislation will require both the expenditure of resources and time.

Other problems are caused by the lack of interaction between those who report the data, those who collect the data, and those who analyze them. In rapidly changing areas such as international financial markets, innovations may require frequent adaptations of reporting systems. Moreover, those who focus narrowly on data collection may not spot implausible reports without years of experience. Automated edit-checks are useful under these circumstances, but are not a complete answer to this problem.

In past decades, an Office of Federal Statistical Policy and Standards played an active role in coordinating statistical efforts across government agencies. However, in the 1980's this office atrophied...
Transactions are treated as services (net labor value added).

Merchandise exports and imports, but in the Mexican data these
are treated as merchandise trade. In the U.S. data, it is included in
the treatment of merchandise trade. In Mexico, data is compiled by
differences in the Commerce Department currently is involved in a study with the Mexican
Government attempting to reconcile the two sets of published trade
monitored, underreporting of exports to Mexico may also be a problem.

United States. Although the U.S. border with Mexico is more closely
by substituting Canadian import data for export data collected by the
Portion Trade Division, Bureau of the Census (corrections for this problem
the U.S. and Canada is a particular problem. The Commerce Department
coverage of exports at the many open border crossings between
vortations such as so-called "tech" shipments or armaments.
coverage is limited to goods that might involve possible export license
Export listing requirements are not monitored carefully; stringent
likely to be somewhat less adequate. Unlike imports, compliance with
smuggled goods, such as drugs. Imports, coverage of exports. However, is
near the United States is likely to be reasonably complete. Exempt for
coverage by the Customs Service of imports of goods as they

A. Exports and Imports of Goods.

Well as other data collection efforts.

First step in improving the data on U.S.-Mexican transactions, an
coordination data collection across Federal Agencies would be a useful
improving the quality of Federal statistics, establishing priorities, and
private sector, revealed of this office, and its reeducation to
and focused explicitly exclusively on reducing reporting burden for the
Efforts to reconcile U.S. trade data with other major trading partners (to improve the basis on which to judge the reliability of U.S. statistics) is also being undertaken with the European Community and Korea, although the coverage problem is unlikely to be as large in the absence of a long land border. A study was completed in March 1991 that reconciled the U.S. and Japanese merchandise trade data for 1989; when estimated adjustments for differences in coverage and definitions were made, the difference between U.S. export and Japanese import data was only $1.3 billion out of total U.S. exports to Japan of $44.5 billion.

Audits of a sample of exports through four major airports in 1988 also suggested that coverage at airports of exports to countries other than Canada is substantially better than coverage of exports to Canada. It should be noted, however, that even if overall coverage of exports were fairly complete (e.g., 95 percent), the dollar value of omitted exports would still be substantial (about $20 billion in 1990). Improvement in the coverage of exports through air, sea, or overland ports would require additional manpower and efforts devoted by the Commerce Department and the Customs Service to verify documents. In addition, it would be useful to clarify the legal authority of the Commerce Department to investigate exporters' books and to penalize them for failure to file timely or accurate declarations.

While coverage of U.S. trade in goods is probably fairly good, the accuracy of valuations is probably a more serious problem. Understandably, the Customs Service monitors declared values of dutiable imports more carefully than other imports or exports. At the same

9. For this reason free trade agreements, such as the one recently signed between the U.S. and Canada, may result in a deterioration in the trade data.
In the reporting of military exports, it is conceivable that problems and statistics in the statistical discrepancy. However, under most circumstances, military exports are not large enough to account for major problems and statistics in the statistical discrepancy. It is not always run smoothly, and may, on occasion, contribute to an additional problem in the trade data. The trade data may be improved in the accuracy of multinationals, corporations to reduce their U.S. income tax liabilities. By-product of these IRS efforts may be expanded the use of transfer pricing by powers of the IRS to deal with the use of transfer pricing by U.S. corporations. Congress has recently expanded the lower tax jurisdictions abroad by overtaxing the value of imports and may use transfer prices to shift profits and hence tax liabilities to lower tax jurisdictions abroad. In addition, multinational corporations, which are subsidiaries of U.S. companies, may misrepresent the value of exports or imports. Besides efforts to mitigate customs duties paid to other governments, traders may misrepresent the value of exports or imports to the U.S. or other governments. When faced with capital controls, in order to disguise capital exports from countries to the U.S., traders may also misrepresent the value of some exports and imports paid at the presence of trade barriers may give traders strong incentive.
The net effect of inadequacies in the trade data on the statistical discrepancy is not clear. Omitted drug imports may very well be on about the same scale as omitted or understated exports. As for contributing to wide swings in the statistical discrepancy, it seems unlikely that errors and omissions in the reporting of trade in goods would vary sharply from period to period.

B. Exports and Imports of Services

Over the last decade, the Office of the U.S. Trade Representative has lobbied hard and effectively for improved data on international trade in services for use in the current GATT negotiations. BEA has responded by adding estimates for a long list of services to the accounts (many based on new surveys), improving estimates for services already included in the accounts, and providing separate estimates for certain services that previously had been aggregated with other items in the accounts. Table 1, reproduced from Ascher and Whichard, provides an overview of these improvements. The net impact of the introduction of these improvements was to increase recorded net exports of services and to reduce the positive statistical discrepancy in the U.S. international transactions accounts by about $10 billion per year in 1987 and 1988.

Much has been accomplished, but certain problems remain. Responses to the survey of travelers' expenditures are very low and estimates of receipts and payments are probably subject to a substantial

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<th>Item</th>
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<td>Sales of U.S. other services less military services in dollars</td>
<td>59,480</td>
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Table 1: U.S. Cross-Border Transactions in Services: 1979 and 1980

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<th>Year</th>
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margin of error. Estimates of financial services provided to foreigners such as swaps and foreign exchange transactions are incomplete. The survey of business, professional, and technical services probably is more adequate on the export side than the import side; providers of these services to foreigners are more likely to be easily identified than purchasers from foreigners. Although recent improvements in the data on services have reduced net omitted receipts, it is not clear that further improvements would necessarily operate in the same direction. Moreover, continued efforts are required to keep up with a rapidly changing world.

C. Unilateral Transfers

Unilateral transfers include a wide range of both government and private transfers. Among the more problematic items are estimates of immigrants' transfers. The United States receives large numbers of immigrants each year; not all are penniless, but no estimate of their wealth is included in the accounts. This omission contributes to a positive statistical discrepancy in the accounts to the extent that reported holdings of foreign residents decline and those of U.S. residents increase as a result of immigration.13 Lack of information on immigrants' assets abroad would also lead to a continuing underestimation of U.S. investment income. On the other hand, immigrants frequently make remittances to relatives left behind; coverage of these remittances is incomplete, and does not include any currency sent.14 It is not clear

13. BEA has occasionally made adjustments to unilateral transfers of this sort. For example, an adjustment of about $1 billion was made when John Paul Getty died, because, although he was a U.K. resident, his estate was a U.S. resident.
14. Evidence gathered in connection with the recent amnesty granted to illegal immigrants indicates that the total of these remittances sent abroad has been substantially understated.
Traded on exchanges are reported (aggregated with other purchases or sales), data on limited partnerships; in practice, only partnership interests in the Treasury International Capital (TIC) S-Reports. Currently only partnership interests in an unincorporated enterprise. In theory, the equivalent interest in an unincorporated enterprise may be direct or real estate investment through limited partnerships (since direct investment reports are required on residential real estate for personal use or real estate investment through limited partnerships). No direct investment reports are required on real estate. (J. Real Estate Fall 2012: 123-142.)

The criteria of various reporting requirements are common. Moreover, most foreign investments in U.S. real estate failed substantially as a likely problem area because small investments in real estate may occur before data from new reporters are available, resulting in more of the equity of publicly traded U.S. companies. In addition, 10% of SEC regulations require registration of the purchase of 5% percent of more in the case of small investors or private transactions. This is misleading as are some foreign investors in the United States. This is undoubtedly some U.S. companies making direct investments abroad are publicly available information for the names of new reporters.

Reasonably complete, BEA develops substantial resources to monitoring extensive series of legally required reports. Coverage is thought to be adequate and complete. Important are collected by the BIS through an income earned on these investments are collected by the BIS.
sales of stocks). Perhaps some thought should be given to changing the way data are collected on the international transactions that are associated with limited partnerships or with various forms of cooperation such as research partnerships, technology sharing, or contractual production.

Direct investment reports for balance of payments purposes include information on income (dividends, interest, and reinvested earnings) and capital flows (changes in equity capital, intercompany debt, and reinvested earnings). Since these data are required by firms for a variety of purposes, accurate reporting should be routine. BEA does monitor the data carefully, but is necessarily dependent on reporters to devote sufficient resources to ensure accuracy; BEA does not conduct audits of firms' books. Late reports are an increasing problem. In addition, foreign investors in the United States are sometimes unfamiliar with reporting requirements and recently acquired firms, heavily debt-burdened and stripped of "fat", may not devote sufficient resources to ensure accurate reporting.

In addition, it is uncertain whether wholly-owned U.S. affiliates of foreigners report as instructed using U.S. generally accepted accounting practices rather than U.S. tax accounting or foreign accounting practices. Differences between economic and tax depreciation charges could have substantial impacts on reported income and reinvested earnings. Since reinvested earnings are included in capital flows as well, the net impact on the statistical discrepancy of the use of these

15. Clarification of the TIC-S reporting instructions in July 1990 may help some, but since many real estate partnerships are formed without the participation of current S-form reporters, coverage is likely to continue to be inadequate.
of direct investment.

The likely current account deficit resulting from the recent large inflow
of investment earnings. The answer to this question is crucial in assessing
the current economic situation.

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large acquisitions or sharp shifts in financing patterns. However, it would be an unreasonable imposition of burden on firms to insist that they keep a separate set of books on a calendar year basis for their reports to BEA.

Another potential problem in the direct investment accounts that could contribute to the statistical discrepancy is caused by the fact that accounts receivable and payable between affiliates and parents may be denominated in foreign currency as well as dollars. Changes in their dollar value, which are used to estimate capital flows, could reflect exchange rate changes as well. If these accounts are largely dollar denominated or if payables and receivables in each foreign currency largely balance, then only small errors would be introduced by assuming that changes in the dollar value reflect capital flows. However, no information on currency denomination is currently collected; an occasional question, perhaps added to the periodic benchmark surveys, would be useful in determining whether the practice of denominating accounts receivable or payable in foreign currencies is widespread.

E. Currency

BEA does not include estimates of increases in foreign holdings of U.S. currency in the U.S. international transactions accounts. Conceptually, they belong in the accounts; foreign assets in the United States include non-interest bearing obligations of the U.S. government (currency) as well as interest bearing obligations such as Treasury securities. Estimates of U.S. currency in the hands of foreigners are necessarily imprecise. Piecing together information from surveys of households' currency holdings, assumptions about businesses' holdings, IRS estimates of the volume of illegal domestic transactions, and
forexgers hold about half of the U.S. currency outstanding. Rest of the country are explained by forexger demand, suggest that
currency velocity between the New York Federal Reserve District and the
forexers of currency lost or destroyed suggest that between one and
estimates of currency lost or destroyed suggest that between one and

U.S. bank transactions for foreigner's (a recorded inflow), without a
states illegally through the banks, the accounts would show an increase in
payments for drugs are laundered abroad, and flow back into the United
currency are understood by equal amounts. However, if the cash
deficit and the net inflow of capital (increased foreigner holdings of U.S.
producers for them go unreported. That is, both the current account
affected, since both the imports of drugs and the payments to foreigner
trade. In this case, the net statistical discrepancy is not directly
U.S. currency probably end up in foreigner hands as a result of the drug
U.S. currency are probably omitted on both sides. Significant amounts of
many transactions that result in increased foreigner holdings of
sides of the transaction are omitted.

A transaction will not add to the net statistical discrepancy if both
negatecve errors and omissions. In a system of double entry bookkeeping,
that the statistical discrepancy is the net of much larger positive and
30 years (about ²20 trillion). However, the reader should bear in mind
discrepancy in the U.S. International transactions account over the past
statistical cnetral relative to the size of the cumulative statistical
These totals on foreigner holdings of U.S. currency are
were particularly large in 1990, perhaps more than 1½ trillion.
of sources indicates that increases in foreigner holdings of U.S. currency
foreigners -between ²85 and ²170 trillion. It is
two-thirds of the U.S. currency outstanding may be in the hands of

corresponding entry of the opposite sign (an unrecorded outflow). To the
extent that currency payments abroad flow back into U.S. banks, the net
impact of the drug trade on the statistical discrepancy would be
negative.

In addition to cash payments to cover drug imports, U.S.
currency ends up in foreign hands through a variety of channels. Banks
(including the Federal Reserve Bank of New York) both make outgoing
shipments and receive incoming shipments. U.S. tourists spend currency
abroad and foreign tourists bring cash to the United States with them.
U.S. residents send cash to relatives abroad and migrant workers take
cash home with them.

Only limited data are available on these currency shipments.
Persons taking more than $10,000 in currency into or out of the United
States are generally required to file a Currency and Monetary Instruments
Report with Customs (CMIR). However, Customs' emphasis is on finding
evidence of illegal transactions, not collecting accurate aggregate data.
There are certain exemptions from the reporting requirement (which
Treasury currently is considering eliminating), and compliance and
enforcement are spotty, particularly on the outflow side.

Efforts should be made to close these gaps in the Treasury CMIR
reports and the data should be incorporated in the international
transactions accounts. Alternatively, a regular survey of banks involved
in incoming and outgoing shipments could be initiated. Admittedly, the
accounts would still lack data on illegal shipments of currency, currency
inflows and outflows associated with most tourists, and currency mailed
by U.S. residents to relatives abroad. One would guess that the currency
outflows through these other channels are likely to exceed the currency
The Federal Reserve banks actually collect the data as agents for the Treasury. The costs to the Federal Reserve banks of collecting the TIC data are covered by their own budgets.

Particularly on non-traditional transactions, interest rate inadequacy to the task of providing meaningful information, collection system, the current system has become a patchwork, requires periodic efforts to rethink the whole capital flows data international capital flows. To collect adequate data on these flows, financial intermediaries and corporations no longer cover the bulk of and new participants; information from a limited number of large financial markets, and estimation of capital controls have all contributed to the increasing internationalization of financial markets.

In recent decades, innovation, technological change, deregulation of rapidly changing financial market conditions, has been adequate to maintain the overall quality of the data. In the face of Treasury and the Federal Reserve banks (particularity New York) have not resources available to monitor these portfolio capital flows at the transactions, trade credits, etc. Despite advances in automation, the short-term negotiable instruments, bond deposits, loans, inter-bank transactions such as the purchase and sale of long-term securities, for data on portfolio capital flows, these include a wide variety of The Treasury International Capital (TIC) reports are the source of portfolio capital flows.

Currency outflows through other channels, currency held abroad, unless it is supplemented by estimates of net reports (is likely to produce underestimates of the increase in U.S. inflows use of the Treasury net disbursements data or a system of bank

19
In addition to a systematic review of the entire data collection system, it would also probably be useful to change the instructions to reporters on identification of foreigners. Currently, foreign residents are identified by their address; however, some foreigners may arrange to get their mail through a U.S. affiliate or relative or use a U.S. agent. More accurate data would probably be obtained if reporters were instructed to use their customers' tax identification information (which financial institutions are legally required to collect) instead.20

1) Bank claims and liabilities

The data provided by banks on their own claims and liabilities vis-a-vis foreigners are generally assumed to be fairly accurate. The data are reported to regional Federal Reserve Banks and aggregated by the Federal Reserve Bank of New York, as agents for the Treasury. Given Federal Reserve powers over the banks, they tend to be cooperative, but errors do occur: respondents enter data in the wrong columns or on the wrong lines, they report in dollars rather than thousands of dollars, or bugs appear when changes are made to reporters' automated systems or when their new employees are inadequately trained.

As a user of these data, I have uncovered numerous errors in the process of investigating large changes that would not be expected on the basis of known financial market developments. Undoubtedly, many less glaring errors go undetected. The FRBNY always questions reporters about

20. Use of W-8 tax filings to identify foreigners would need to be supplemented by instructions to classify certain tax exempt foreigners (e.g., IBRD, official monetary authorities, etc.) correctly. Treasury, in conducting the 1984 Benchmark Survey of Foreign Portfolio Investment in the United States compiled the necessary list. One drawback of using the W-8 rather than address as the criterion for identifying foreigners is that certain U.S. citizens resident abroad may still be subject to U.S. taxes, and therefore would be incorrectly identified as U.S. residents.
It is to be uncovered, however, that there are more sources of information on banks than one might assume. Moreover, the Federal Reserve System has alternative sources of information. Therefore, when the Federal Reserve reports changes in bank balances, such as an increase in checking account balances, it is usually a reflection of changes in the banks' reporting systems or in their reporting procedures. Consequently, the accuracy of these reports is questionable, and the differences in definitions which make these reports uncorrectable errors.

Accounts in the same quarter, they could contribute to significant savings. The other side of these transactions, but if they do not show up in the window dressing by Japanese banks, they may not be the only factor. Financial transactions between the first day of the quarter and the quarter's first quarter or first month are not unusual.

One contributing factor is the apparent reliance on the only factor. This paper examines the effects of these transactions on banks' balance sheets and their implications with respect to

Uncorrectable errors. 22

Identification of information on reports should be performed by the computer checks for consistency across reports. 22 Efforts to eliminate these overlaps to provide assurance that the reports are accurate without much investigation unless they are confronted with personal tend to produce assurance that the reports are accurate.
in the statistical discrepancy. Similarly, timing discrepancies between crediting and debiting of accounts in other transactions could also contribute to the swings in the statistical discrepancy.

Another potential problem is that capital flows for banks are calculated from changes in asset positions, but other factors can also produce changes in asset positions. Write-offs of loans are not systematically reported and may produce apparent capital flows where none actually occurred. First differencing of positions may also be inaccurate for foreign-currency denominated claims and liabilities; changes in the dollar value of these claims and liabilities would be the result of exchange rate changes as well as capital flows. However, if currency positions are about matched for each currency, the net error introduced may be small. There is no information collected on the composition of foreign currency claims and liabilities; these claims and liabilities were each about $60 billion in March 1990, up from only about $10 billion as recently as 1984.

2) Securities purchases and sales

Purchases and sales of foreign securities (stocks and bonds or notes with maturities longer than one year) by U.S. residents are reported by securities dealers in the United States. Communications advances in recent years have made it more likely that ordinary U.S. residents (not only tax evaders or criminals) may conduct securities transactions with intermediaries outside the United States (e.g., the London office of Merrill Lynch), undermining the coverage of the reports. The problem of incomplete coverage may also be aggravated by recent SEC

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23. This problem is compounded by the fact that, while banks are required to report their books as of the last business day of the year, there is some latitude for other reporting dates in the TIC reports.
directly comparable because the Japanese data include all purchases of
purchases of U.S. Treasury securities. In fact, these data are not
apparent discrepancies between U.S. and Japanese data on Japanese
Much attention has been devoted to the financial press to the
case of private placements by firms that are not regular reporters.
 convertible bonds. Coverages of such bonds is likely to be incomplete in the
reports from corporations that sell bonds directly to foreigners (e.g.,
and stocks. The reports of securities dealers are supplemented by
corporations and federally sponsored agencies, corporate and other bonds,
reported: U.S. Treasury bonds and notes, bonds of U.S. government
reports by securities dealers in the United States. For categories are
purchases and sales of U.S. securities by foreigners are also

current estimation methods, these would now be negligible.
publishing data on U.S. holdings of Japanese stocks because, unlike
improve on currently available information. For example, BCA has stopped
investors, and financial institutions, although incomplete, would vastly

data from a survey covering only major corporations, institutions
is currently actively considering undertaking such a benchmark survey.
coverage would be far more difficult to achieve. However, the Treasury
far more respondents than the Ingram benchmarks, and reasonably complete
argued that a comprehensive outward benchmark would require a survey of
undertake a new benchmark survey because of cost considerations; it was
conducted during World War II. Until recently, Treasury was reluctant to
Treasury benchmark survey of U.S. portfolio investment abroad was
The extent of the coverage problem is uncertain. The last
bonds.

ultures facilitate secondary trading by institutions in unregistered
U.S. Treasuries worldwide while the U.S. data include only securities sold directly from the United States to Japan. The development of active markets for U.S. Treasury securities in London and the Far East have made such bilateral data comparisons impossible; the U.S. reporting system cannot identify the ultimate purchaser of a U.S. Treasury security in the London market. However, the cumulative total of Treasury securities sold to all foreigners according to the U.S. data appears too low to be consistent with the Japanese estimates of their holdings. This issue may be settled by the results of the Treasury benchmark survey of foreign portfolio investment in the United States in 1989 that is currently underway.

As a result of the growth of markets abroad where U.S. securities are actively traded, the vast geographic detail collected on the TIC-S form is of limited use, for it yields no insight into the ultimate purchaser of U.S. debt instruments. Eurobonds account for most U.S. corporate bonds sold to foreigners; they are generally distributed through underwriters in London and are therefore reported as sales to the United Kingdom. U.S. Treasury securities are also actively traded in London. The geographic detail on U.S. purchases and sales of foreign securities is of limited use as well. All foreign securities are aggregated so it is impossible to distinguish the U.S. sale of a Canadian bond to a Japanese resident from the sale of a Japanese bond to a Japanese resident. The problem with equities is currently less acute, but likely to become serious as well, as the listing of equities on foreign exchanges becomes more common.

The vast geographic detail is of limited use in facilitating bilateral comparisons of data as well. For example, the Japanese report
bonds issued by residents of third countries.

Because the foreign bond category in each country's data would include
Japanese bonds designated as foreign, the U.S. or Japanese bonds purchased or
sold on Japanese residents could be compared with the Japanese data on sales
from Japanese residents. For example, the U.S. data on U.S. purchases or sales of all
bonds, the location of the purchaser or seller,

24. The Japanese reporting of transactions in U.S. corporate securities

transactions, permuting bilateral comparisons at the aggregate level.

Securities transactions reported on the basis of the nationality of the

Another alternative would be to change the IMF Guidelines and have

bonds sold. This method is theoretically possible provided by other countries to assess

alternative would be to collect no geographic detail on foreign purchases

information comparable to the data collected by foreign countries. One

purchase; there is no way the TIC-S form reports could provide

in the United States have no way of knowing the identity of the ultimate

location of the buyer or seller. However, for U.S. securities, reporters

reporters could indicate the nationality of the depositor, rather than the

reporting instructions for U.S. purchases or foreign securities; where transactions are booked. The united states could change the TIC-S

Japanese purchases of U.S. securities than there is in the question of

appropriate in the sense that there is far more interest in the size of

purchases on the basis of the residence of the depositor. This approach is

securities in London, IMF Guidelines suggest classifying securities

within the Kingdom does not collect data on foreign transactions in foreign

in the same manner. The transaction is booked by a financial intermediary in London. 24. The

ail U.S. Treasury securities as purchases from the United States, even if
Periodic benchmark surveys of holdings would be necessary to provide information on the basis of the nationality of the debtor.

3) Options, warrants, and futures

Derivative instruments such as options, warrants, and futures are currently only partially covered in the U.S. international transactions accounts. Some data on these transactions are available; however, thorny theoretical and practical problems make it difficult to separate capital flows from service or investment income and capital gains in connection with many of these transactions.

In theory, warrants and options are included in the TIC-S reports when the underlying security is a stock or long-term bond. Data on purchases and sales of these instruments are aggregated with purchases and sales of U.S. or foreign bonds; since they are not available separately, judgments about the adequacy of coverage are impossible. All other options or warrants are omitted. In addition, BEA estimates the margin accounts and profits and losses on futures trading, based on information on foreign transactions on U.S. futures exchanges, and includes these estimates in liabilities to unaffiliated foreigners (TIC-C). U.S. residents' participation in foreign futures transactions are omitted entirely. Cooperative efforts with various regulatory agencies such as the CFTC and SEC might lead to data improvements in this area.

4) Limited Partnerships

Only those investments in limited partnerships that are listed on exchanges are covered; they are aggregated with foreign purchases of U.S. stocks in the TIC-S reports. The IRS is currently automating responses on tax returns, and as a by-product they soon will be able to produce a list of limited partnerships in which foreigners have some
were conducted. Yielding few additional TIC-C forms reported, a survey of 8,000 U.S.-owned companies to have financial and United States has mushroomed. Affiliates of foreign companies probably conducted in 1978. Since that time, foreign direct investment in the constant problem. The last systematic canvass of potential reporters was all those with reportable claims or liabilities vis-à-vis foreigners is a

The number of potential C-form reporters is large, and reaching also.

failure to report (in newspapers and trade journals which be considered would be useful. Advertising reporting requirements (and penalties for particularly the corporate sector, on the need for accurate statistics and accuracy of their reports. Continuous efforts to educate the public, and to be less cooperative (and sometimes hostile) when questioned about the subject to the regulatory authority of the Federal Reserve and they tend the weakest link in the TIC system. In general, TIC-C reporters are not the claims and liabilities vis-à-vis foreigners. These reports are probably claims and liabilities on and liabilities to unaffiliated foreigners

5 Foreign claims on and liabilities to unaffiliated foreigners should be studied.

collecting data on foreign participation in U.S. limited partnerships (although not when they occurred), the current method of the extent of the omission of foreign investments in limited partnerships. When the IRS acquisition effort is complete, the Treasury will know the payments accounts because it was in the form of limited partnerships.

state. As discussed earlier, it is suspected that much foreign
commercial ties with unaffiliated foreigners. They are also more likely to be unfamiliar with U.S. reporting requirements. Rather than conduct another general canvas, it might be more cost-effective to focus on these affiliates; Treasury could check its list of C-form reporters against a list of U.S. affiliates of foreign companies provided by BEA and canvas those who are not current reporters. 27

In some sense, the C reports are a residual report, catching transactions that are not reported by someone else. They exclude direct investment transactions, securities, and custody items reported by banks, brokers, and dealers. There is frequently room for confusion about reporting responsibilities. One serious problem, the reporting of loans to U.S. residents booked at banks outside the United States, was resolved (at least partially) by the introduction of the BL3 report in mid-1986. Banks in the United States, with any knowledge of loans to U.S. residents booked at their offshore offices, are required to report these loans as custody liabilities or file a BL3 form notifying the borrower (with a copy to FRBNY) of their responsibility to report the loan on the C-form. Banks have uniformly chosen the first alternative. As a result of this clarification of reporting responsibility, custody liabilities reported by banks increased by $18 billion, while financial liabilities reported on the C form remained virtually unchanged.

However, comparisons of the data reported on custody liabilities and data reported to the BIS suggest that reporting of bank loans from

27. If focusing only on U.S. affiliates of foreign companies was viewed as discriminatory, U.S. companies with foreign affiliates might also be canvassed.
Rather than deposits, overthe-counter deposits as deposits; they are considered bank deposits.

Certain cases, for example, reports are instructive not to classify
30. The TIC definitions allow appropriately deposits from common usage in
issues with considerablely resistance.

Series of trade balances, transactions with U.S. residents booked outside the United
29. The Federal Reserve Board releases monthly reports on the foreign offices of
commercial paper and bankers acceptances. It is not clear whether these

Differences in definitions Preclude precise comparisons.

28. Differences in definitions Preclude precise comparisons and

and are reported (505 Federal Reserve Board on the BLK) as custody.

Foreigners are frequently held in custody by U.S. financial institutions,

Certificates of deposit (CDs) and bankers acceptances (BAs) purchased by
U.S. short-term negotiable instruments such as commercial paper,

6. Short-term negotiable instruments

Avoid double-counting.

Alternative data sources would require changes in the TIC instructions to
suggest that the TIC data are seriously understated.
0. Again, the use of
reports: comparison of TIC totals with BIS and Federal Reserve data

could be substituted for the amounts currently included in the TIC

Similarly, reports from banks abroad of U.S. residents deposits

counting.

Reevaluate changes in the TIC reporting instructions to prevent double-
system for obtaining data on bank loans to U.S. residents would also
from banking offices located outside the United States. For the current
residents from offices outside the United States. 29
Substitution of data

should be explored with the BIS and other central banks as the
abroad to U.S. residents may still be incomplete.

- 30 -
liabilities. \footnote{31} Separate information is also provided on CDs held in custody. In addition, U.S. firms that issue commercial paper or short-term instruments (with maturities of 1 year or less) directly in the Euromarkets are supposed to report these as financial liabilities to foreigners on the TIC-C forms.

Since 1978, when the TIC system was last redesigned, the U.S. commercial paper market has grown to about six times its earlier size; borrowers have found it advantageous at times to issue their own short-term negotiable instruments rather than turn to the banks for funds. It would be useful to have more information on the participation of foreigners in the U.S. commercial paper market. At minimum, these short-term negotiable instruments should be covered in the Treasury's periodic benchmark surveys of foreign portfolio investment in the United States.

U.S. holdings of foreign commercial paper, CDs, or BAs are also frequently held in custody by financial institutions and reported as custody claims (TIC-BQL). Instruments not held in custody are supposed to be reported directly as financial claims on the TIC-C reports. Coverage is clearly inadequate. For example, at the end of June 1990, $27.5 billion in foreign negotiable instruments were reported as held in custody for U.S. residents by TIC-B form reporters. Another $17.5 billion in financial claims on foreigners was included in the TIC-C reports, summing to $45 billion. However, the FRBNY survey of commercial paper outstanding in the United States indicates that foreigners had $65 billion in commercial paper alone outstanding in the United States at the

\footnote{31. Some of the CDs included in these reports have maturities of longer than 1 year.}
That U.S. holdings of dollar paper are not significant.

Commercial paper issued in the United States by foreign residents and
affiliates of foreigners.

32. The alternative assumption that foreigners are not large takers of
issues by the U.S. Bank of England have substantial holdings of dollar paper issued by foreign banks in the United States, but it seems unlikely that they purchase some of the commercial
dollar paper.

G. Portfolio Investment Income

G. Portfolio Investment Income

and C Reports (should be considered. 32 changes in the TIC instructions to exclude commercial paper from the BC
foreign issues of commercial paper in the United States (along with
short term instruments. In addition, substitution of FRN data on
portfolio investment abroad should include commercial paper and other
foreign negotiable instruments.}

Appendix B: Bank of England data indicate that banks in the
United Kingdom hold about $22 billion in cds in custody for U.S. banks.
In addition, U.S. residents have substantial
holdings of foreign debt. Bank of England data indicate that banks in the
United Kingdom hold about $22 billion in CDs in custody for U.S.
residents, and another $21 billion is held in custody for U.S. banks. It
appears that the TIC data grossly underestimate U.S. residents' holdings of
nonbanks, and another $21 billion is held in custody for U.S. banks. It
income payments world-wide far exceed reported portfolio investment income receipts. Moreover, the U.S. estimates of portfolio investment income receipts and payments are based on shaky data on holdings. In addition, there are problems in estimating certain returns.

The accuracy of the data on holdings depends on the TIC data discussed above. As noted earlier, there are serious problems with the data on U.S. residents' holdings of bank deposits abroad. Comparison with Federal Reserve, BIS, and IMF data suggest that they may be underestimated by more than $100 billion, leading to a substantial underestimation of interest income.\(^{34}\) Holdings of foreign commercial paper also appear to be substantially underestimated. On the other hand, BIS data suggest that U.S. borrowing from banks outside the United States may also be understated, resulting in underestimation of interest payments to foreigners. In addition, the statistical discrepancy in the U.S. international transactions accounts has cumulated to about $250 billion in recent decades; if a substantial fraction of these errors and omissions were unrecorded capital inflows, then payments of investment income to foreigners would be underestimated.\(^{35}\)

Another source of errors in BEA's estimates of portfolio investment income is assumed returns. BEA is aware of inadequacies in this area and is actively exploring possible improvements. Because of resource shortages, BEA's assumptions about appropriate rates of return are sometimes out of date. For example, no interest is assumed paid or earned on foreign currency deposits because, many years ago, these were

\(^{34}\) However, acceptance of these higher estimates for U.S. assets would imply that there were omitted capital outflows in earlier years.\(^ {35}\) There would be no payments to foreigners on holdings of currency or residential real estate for personal use, however.
In recent years, the estimation of the
constant for floating rate notes or in the case of interest rate or
warrant of bonds sold or retired. However, rates cannot be assumed
some guess must be made about the maturities of bonds purchased and the
could be assumed that interest rates on outstanding bonds do not change,
bonds is analogous to the method used for stock dividends. Even if it
BEA’s methodology for estimating interest earnings on long-term
overseas was conducted during World War II.
since the last Treasury benchmark survey of U.S. portfolio Investment
holdings of foreign stocks are subject to a very wide margin of error.
Yields on major foreign stock markets. However, estimates of U.S.
for estimating dividend receipts, using information on average dividend
of changes in stock prices, BEA plans an analogous change in this method
combined with subsequent reports of net purchases (TIC-5) and estimates
benchmark surveys of foreign portfolio investment in the United States.
foreign holdings of U.S. equities are based upon the periodic Treasury
on Standard and Poor’s composite yield on 500 stocks. The estimates of
estimates of foreign holdings of U.S. equities combined with information
as of June 1990 and revised data back to 1984. The new method uses
years ago. On the payments side, BEA revised its estimating methodology
acquired in 1960 is assumed to earn the same dividend today as it did 30
same as last period plus dividends on additions to holdings of a stock
is also inadequate. The method assumes that income in this period is the
BEA’s methodology for estimating receipts of income on equities
that nonresident balances have grown to this size.
foregin currency liabilities amounted to $68 billion; it seems unlikely
largely foreign currency balances. However, by the end of 1989, banks’
appropriate interest rate has been complicated by the expansion of foreign currency bond markets, the use of interest rate and currency swaps, and the issuance of zero coupons, bonds with warrants attached, and other innovative instruments. The TIC data does not disaggregate these instruments. In this environment, periodic benchmark surveys of U.S. portfolio investment abroad and foreign portfolio investment in the United States are crucial; without periodic benchmarks to check against, any estimating methodology could, over time, produce large errors. In addition, information is needed on currency and interest rate swaps.

Finally, more needs to be done to automate BEA's estimating procedures. PC spreadsheets are used, but much data is entered by hand, rather than transferred directly from BEA's mainframe TIC data base.

**IV. STATISTICAL EVIDENCE**

The review of the data sources and recent history in the preceding sections suggest that problems exist in the reporting of both current and capital account data. This section turns to statistical techniques, particularly regressions, to try to explore the importance of various factors in explaining the statistical discrepancy in the accounts. An obvious approach would be to regress the statistical discrepancy against various current and capital account components of the U.S. international transactions accounts (or the underlying variables that might explain movements in these components) and attempt to compare their contributions to explaining movements in the statistical discrepancy. Unfortunately, the insights that can be obtained from such regressions are limited.
accounts over the period studied. The estimated coefficient will reflect
discrepancy and any single component of the international transactions
The results of a simple regression between the statistical
discrepancy.

must be matched exactly by a change in the opposite direction in the
holding net capital flows constant, any change in the current account

\[ SD = CA^e - CAF^e - CA^f + CAF^f \]
current and capital account times -1.

Reestimating terms, the statistical discrepancy is equal to the sum of the

\[ 0 = CA^e + CAF^e - CA^f - CAF^f \]
and omissions in the capital account (\(K^e\)) and errors
account data (\(CA^e\)) plus the recorded net capital flows (\(K^f\)) and errors
recorded current account (\(CA^f\)) and errors and omissions in the current
necessary equal -1 times the change. To illustrate, the sum of the
component of the accounts, holding other components constant, must
in the statistical discrepancy that would result from a change in any
a double entry system which, by definition, must sum to zero, the change
Moreover, since the U.S. international transactions accounts are

misestimated.

The effect is to bias the balance of payments component of the estimated flow rate. The assumption would be high only if there is a
large correlation between the statistical discrepancy and a
particular component of the balance of payments accounts does not prove
errors and omissions in the balancing components. The estimated
coefficient could easily be insignificant, despite systematic errors and
omissions in the reporting of the component studied, because there were
also systematic errors and omissions opposite in sign in the reporting of
the balancing changes in the accounts. Alternatively, the estimated
coefficient could be significant even if there were no systematic errors
and omissions in a particular component studied if there were systematic
errors and omissions in the balancing component. In addition, since
the composition of these balancing changes may vary depending on the
cause of the initial change, the estimated coefficients are likely to be
unstable, and very sensitive to the addition or subtraction of
observations.

B. Regression results

Given these problems, it is not surprising that regressions
between the statistical discrepancy and various components of the U.S.
international transactions accounts yield little insight into the sources
of the statistical discrepancy. The R²'s generally are very low and the
size and sign of the coefficients vary depending on whether the sample
ends in 1989Q4 or 1990Q4 and whether the data are first differenced or
used in level form.

However, several other explanatory variables do shed some light
on probable sources of the statistical discrepancy in the U.S.
international transactions accounts. These variables include 1)
variables that are frequently used to explain international capital

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36. For example, there appears to be a systematic negative relationship
between official capital inflows and the statistical discrepancy; the
most likely explanation is that part of the decrease in private assets in
the United States that occurs when official holders buy dollar assets net
is unrecorded.
statistical discrepancy would be related to measures of capital flight.

In unrecorded capital inflows into the United States, the U.S.

If capital flight from financially troubled IDB debtors resulted

2. A measure of capital flight from IDBs

attraction and/or of dollar-denominated assets and unrecorded flows.

that there is not a simple relationship between the relative contribution substantially to the statistical discrepancy, they do suggest results do not rule out the possibility that unrecorded capital flows

either coefficient significantly different from zero. While these

much of the variation in the statistical discrepancy (equation 1), not is
correctly expected), as shown in Table 2, these variables do not explain changes (where it is assumed that actual exchange rate changes were

average changes long-term interest rates and expected exchange rate

variables might include the differential between U.S. and weighted

which also explain movements in the statistical discrepancy. Such

flows. Variables that are theoretically relevant in explaining such flows

If the statistical discrepancy were largely unrecorded capital

1. Variables that explain international capital flows

results are reported because they are suggestive.

reflect the net of errors and omissions in all these accounts), the

balanced by changes elsewhere and the statistical discrepancy will

change in one of the U.S. international transactions accounts must be

immune to the implications discussed above (any variable that causes a

explaining U.S. merchandise trade, while these regressions are not

changes in the statistical discrepancy, and 6) errors in a model

U.S. currency outstanding, 4) the level of interest rates, 5) lagged

flows, 2) a measure of capital flight from IDB debtors, 3) changes in
Table 2
Regression Results

1. Dependent variable: Level of the statistical discrepancy
Sample period: 1972Q1-1990Q4

<table>
<thead>
<tr>
<th>Explanatory variable</th>
<th>Coefficient</th>
<th>T. stat.</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>4.0</td>
<td>4.15</td>
<td>.03</td>
</tr>
<tr>
<td>U.S.-foreign interest rate differential 2/</td>
<td>.47</td>
<td>.72</td>
<td></td>
</tr>
<tr>
<td>Exchange rate changes 2/</td>
<td>.41</td>
<td>1.70</td>
<td></td>
</tr>
</tbody>
</table>

2. Dependent variable: Level of the statistical discrepancy
Sample period: 1974-1989 (annual data)

<table>
<thead>
<tr>
<th>Explanatory variable</th>
<th>Coefficient</th>
<th>T. stat.</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>4.7</td>
<td>1.06</td>
<td>.29</td>
</tr>
<tr>
<td>Capital flight 4/</td>
<td>.96</td>
<td>2.65</td>
<td></td>
</tr>
</tbody>
</table>

3. Dependent variable: Level of the statistical discrepancy
Sample period: 1970Q1-1990Q4

<table>
<thead>
<tr>
<th>Explanatory variable</th>
<th>Coefficient</th>
<th>T. stat.</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-1.2</td>
<td>.83</td>
<td>.15</td>
</tr>
<tr>
<td>Change in U.S. currency outstanding 2/</td>
<td>1.86</td>
<td>3.69</td>
<td></td>
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4. Dependent variable: Level of the statistical discrepancy
Sample period: 1970Q1-1990Q4

<table>
<thead>
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<th>T. stat.</th>
<th>R²</th>
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</thead>
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<tr>
<td>Constant</td>
<td>-2.1</td>
<td>-.79</td>
<td>.04</td>
</tr>
<tr>
<td>U.S. Treasury bill rate 6/</td>
<td>.73</td>
<td>2.18</td>
<td></td>
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5. Dependent variable: Change in the statistical discrepancy
Sample period: 1970Q3-1990Q4

<table>
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<tr>
<td>Constant</td>
<td>.2</td>
<td>.32</td>
<td>.36</td>
</tr>
<tr>
<td>Lagged change in the statistical discrepancy</td>
<td>-.38</td>
<td>-3.65</td>
<td></td>
</tr>
<tr>
<td>RHO</td>
<td>-.38</td>
<td>-3.62</td>
<td></td>
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</tbody>
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6. Dependent variable: Level of the statistical discrepancy
Sample period: 1973Q1-1988Q4

<table>
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<th>Coefficient</th>
<th>T. stat.</th>
<th>R²</th>
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<tr>
<td>Constant</td>
<td>3.1</td>
<td>3.43</td>
<td>-.01</td>
</tr>
<tr>
<td>Trade model residual</td>
<td>-.27</td>
<td>-.56</td>
<td></td>
</tr>
</tbody>
</table>

---

1/ Data are in billions of dollars. The quarterly data on the statistical discrepancy exclude the seasonal adjustment discrepancy. All regressions were OLS except equation 5, where adjustment for serial correlation was necessary.
2/ Interest rate on 10 year U.S. treasury bonds minus the trade weighted average of rates on 10 year government bonds for the G-10 countries.
3/ Percent change in the Federal Reserve trade weighted index of the value of the dollar against G-10 currencies ((I_t - I_{t-1})/I_{t-1}) x 100.
4/ Capital flight from 10 Latin American countries and the Philippines. Equal to the gross external debt plus the inflow of net foreign direct investment minus the current account deficit, minus the change in external assets of the central banks and the commercial banks.
5/ Source: Flow of Funds accounts.
6/ U.S. Treasury bill rate - 3 month, secondary market.
The Intermarket accounts, omission of transactions that result in
being minus increases in foreign holdings of U.S. currency from

Currency

are omitted.

accounts; however, this relationship is not sufficiently
the statistical discrepancy in the U.S. Intermarket transactions
relationship between the average rate of inflation in Latin America and
substitution of U.S. currency for local currency. There is a statistically

credual, but rather accelerating inflation, which leads to the
discrepancy skyrocketed. Perhaps it is not "capital flight" that is
indicators are that "capital flight" declined while the statistical
data on "capital flight" in 1990 is not available, preliminary
ended up in unrecorded U.S. capital inflows. Moreover, although incomplete
about 5% of every dollar of "capital flight" from these countries
accounts, however, the coefficient seems implausibly high, implying that
and the statistical discrepancy in the U.S. Intermarket transactions
statistically relationship between "capital flight" from these countries
rather than quarterly. These does appear to be a statistically
comparable to those in the other regressions because the data are annual
central bank and the commercial banks. The $\beta$ in this equation is not
the current account deficit minus the change in external assets of the
of these countries plus the inflow of net foreign direct investment minus
"capital flight" is crudely measured as equal to the gross external debt
one measure of capital flight from Latin America and the Philippines.

The next regression (equation 2) retests the statistical discrepancy to

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increased foreign holdings of U.S. currency would contribute to the net statistical discrepancy if the other side of the transaction were recorded in the accounts. For example, net shipments of currency abroad by banks would contribute to a positive discrepancy because the currency shipments are omitted from the accounts, but the payments for the currency would be recorded. Transactions that are omitted on both sides would not contribute to the net discrepancy (e.g., cash payments for drug imports).

A sharp increase in net currency shipments abroad by banks appears to explain part of the very large statistical discrepancy in 1990.\textsuperscript{38} Economic disruption in Eastern Europe, the Soviet Union, Latin America (particularly run-away inflation in Argentina), and the crisis in the Persian Gulf all probably contributed to foreign demand for U.S. currency. However, since the total increase in U.S. currency outstanding (excluding bank vault cash) in 1990 was only about $22 billion, factors other than increased foreign holdings of U.S. currency must also have played a significant role in explaining the growth of the statistical discrepancy to $64 billion.

Comprehensive historical data on currency shipments abroad by banks are, unfortunately, unavailable. It is therefore not possible to assess directly the contribution of such currency shipments to the statistical discrepancy over a longer period of time. An indirect approach, using data on total U.S. currency outstanding, was tried instead.

\textsuperscript{38} This information is based on informal discussions between FRBNY and certain banks.
The statistical discrepancy between the level of U.S. current account discrepancies and the level of U.S. interest rates is significant. There does appear to be a significant relationship between the amounts involved would tend to increase as interest rates rose. International accounts because U.S. assets abroad were underestimated; `income. If interest income were being underestimated in the U.S., suggested that many countries underestimate their portfolio investment.

The IMF study of the global current account discrepancy

4. Interest Rate Levels

contributed to the statistical discrepancy. Certain outstanding have considered with other factors that might have implications by higher (greater than one) suggest that changes in foreign accounts; however, the coefficient seems to be a significant relationship between the statistical discrepancy and changes in currency outstanding correlated with the level of the proxy for increases in foreign demand for U.S. currency. Second, are particular. The statistical discrepancy does not appear to be a good model for explaining the demand for U.S. currency helps explain demand? The answers appear to be no significant factor does add the statistical discrepancy to a model explaining demand for

This question can be approached from two perspectives: First,
4. These regressions results appear to support the contention that BEA is underestimating portfolio investment income.  

5) Lagged changes in the statistical discrepancy

The statistical discrepancy is highly volatile from quarter to quarter. As indicated by equation 5, changes in the statistical discrepancy in one direction tend to be followed by changes in the opposite direction in the next quarter. Timing problems (i.e., the recording of one side of a transaction in one quarter and the other side in the next quarter) probably contributed to this result.

6) Residuals in a trade model

If there were substantial quarterly swings in the errors and omissions in trade transactions, there would be no reason to assume that such swings would be mirrored in trade model estimates, and the model residuals would reflect these swings. As indicated by equation 6, there does not appear to be any correlation between the residuals of the model used by the U.S. International Transactions Section of the Federal Reserve Board to project the partial trade balance and the statistical discrepancy in the U.S. international transactions accounts. These results suggest that the wide quarterly swings observed in the

40. The estimated coefficient implies that if U.S. short term interest rates were 100 basis point higher for a year, the statistical discrepancy would be about $3 billion higher for the year. Another inference that can be drawn from these results is that BEA is underestimating U.S. net interest bearing assets abroad by about $300 billion and if interest rates averaged about 7 percent for the year, the contribution of underestimated interest receipts to the statistical discrepancy would be about $20 billion. Given the standard error of the coefficient, these estimates are undoubtedly subject to a very large margin of error, but they do suggest the importance of improving the estimates of U.S. portfolio assets abroad and the income earned on these assets.

41. The model residual equals the model estimate minus the recorded partial trade balance (the value of nonagricultural exports minus nonoil imports).
42. The possibility remains that timing problems in the recording of payments for these goods or the expiration of commercial credits contribute to the statistical discrepancy. In fact, the model maintained by the PPP staff predicted a larger trade deficit than what was realized in 1990.

Trade balance was any larger than the recorded data indicate. Estimated models do not suggest that the expected improvement in the merchandise trade balance based on projections of improvement in the merchandise trade balance expected when the statistical discrepancy skyrocketed.

Nor is there any reason to assume that net exports of goods the merchandise trade account, on the statistical discrepancy is uncertain. Its increase is not a new problem, but it is probably greater than previously thought. Underestimation of net exports is not a new phenomenon substantially. On the other hand, exports are less certain.

A negative contribution to the statistical discrepancy and are.

On the current account side, imports of illegal substances make larger than the net statistical discrepancy.

Also likely that gross errors and commissions in the accounts are much larger than the net statistical accounts, in both the current and capital accounts. It is likely that the high statistical discrepancy is the result of U.S. International transactions accounts and various statistical tests.

Years, based on a review of imbalances in the data sources for the transactions accounts has been very large and highly volatile in recent years. The statistical discrepancy in the U.S. International Transactions accounts are probably not the result of errors and

V. CONCLUSIONS

Commission in the reporting of imports or exports of goods. For the
Trade in services is much more difficult to monitor than trade in goods, which can be observed as goods enter or leave the United States. BEA has made substantial advances in improving its estimates of U.S. receipts and payments for services in the past decade, but holes remain. It is not clear, however, whether improving these data would add more to receipts or to payments.

In contrast, both alternative data sources on U.S. assets abroad and the statistical tests of the relationship between the statistical discrepancy and U.S. interest rate levels suggest that net portfolio investment income is substantially understated in the U.S. international transactions accounts. However, because the level of U.S. interest rates did not rise sharply in 1990 on average, omitted portfolio investment income could not have been an important contributing factor to the rise in the statistical discrepancy between 1989 and 1990.44

The sources of the big increase in the statistical discrepancy in 1990 should be sought in the capital flows data, and perhaps in unilateral transfers. One obvious source of the discrepancy is the omission of estimates of increases in foreign holdings of U.S. currency. In 1990, as in other periods of economic and political turmoil abroad, foreigners turned to U.S. currency for transactions and as a store of wealth. Inflation in Argentina, economic disintegration in the Soviet Union and parts of Eastern Europe, and the crisis in the Persian Gulf all contributed to the demand for dollars. However, given the total increase in U.S. currency outstanding in 1990, increases in foreign demand for

44. Interest rates in some foreign countries did rise, but since only a small part of U.S. claims on foreigners is denominated in foreign currencies, only a small impact on omitted interest receipts would be expected.
Another factor that may have played a role in the sharp rise in the U.S. statistical discrepancy in 1990, and the U.S. statistical discrepancy in 1990, quantitatively assessed of the importance of capital flight in explaining unilateral transfers is unrecorded. It would be very difficult to give a reduction in recorded unilateral transfers to foreign residents and an increase in the statistical discrepancy because it is likely to be associated with wealth transfers to wealthy individuals to the United States would contribute to uncertainty about the future of Hong Kong may have increased. Flight of wealth persons as well as their capital may also have occurred.

A measure of "capital flight" from Latin America and the Philippines residents, and therefore missed by the reporting system, while the investments may be made through relatives or friends who are U.S. covered in the capital flow reports. Alternatively, statistically significant amounts tend to be invested in real estate, an area that is underreported historically. That appears to have been the case, perhaps significant historical forms that would escape the reporting system for U.S. capital, and thus with United States. It is not clear why capital flight would necessarily take forms that would escape the reporting system for U.S. capital. Flows, but they appear to be significant. Economic and political turmoil abroad is probably also well.

Statistical discrepancy; other factors must have been significant as well.
indicating their liabilities to unaffiliated foreigners. These reports are probably the weakest link in the TIC reports system; the number of reporters is small and the attention devoted by companies to the accuracy of these reports is minimal. Capital inflows from foreign direct investors to their U.S. affiliates dropped from $71 billion in 1989 to $37 billion in 1990; however information available on acquisitions of U.S. companies by foreigners does not indicate a precipitous decline, raising the question of how these takeovers were financed. 45 While many acquisitions were funded by borrowing by affiliates in the United States, borrowing from financial institutions outside the United States also may have played a role. Much of such borrowing is, in principle, reportable on the TIC-C forms, but if omitted would contribute to the statistical discrepancy. 46 Given the widening spread between prime and libor at the end of 1990, increased borrowing in the Eurodollar market would not be surprising.

The wide swings in the statistical discrepancy from quarter to quarter seem more likely to be the result of errors and omissions in the recording of capital flows as well. Timing problems in the recording of direct investment flows or the counterpart to highly volatile bank flows probably contributed to these swings.

A. Recommendations

1. Renewed and sustained commitment to improving the data on U.S. international transactions is needed. In many cases, this would involve increasing the budgets of the agencies responsible for data

45. Starting with data for 1991, BEA's annual survey of U.S. business enterprises acquired or established by foreign direct investors (BE-13) will provide more information on sources of funding.
46. If the U.S. office of a bank played some role in the loan, the reporting responsibility would rest with the bank and not the borrower.
other items in the TIC reports.

Term instruments, such as commercial paper, that are aggregated with
Moreover, the benchmark surveys should include information on shorter
holdings, the inward and outward benchmark surveys should be designed to
portfolio investment abroad. In addition to providing information on
portfolio investment abroad, the Treasury should undertake a benchmark survey of U.S.

Forms.

Reserve or BIS data (for some information currently reported on these
and/or efforts to substitute alternative data sources (e.g., Federal
serious effort to improve compliance with the reporting requirement
U.S. nonbanks with unaffiliated foreign and (TIC-C reports) requires a

2. In particular, inadequate reporting of the transactions of

best be collected given evolving financial markets.

payments purposes and policy analyses and to assess how such data could
We need to reconsider what kinds of data are necessary for balance of
market participants as well as government data collectors and analysts.
capital flows is needed, drawing on the views of academics and financial
A basic review of the data collection system for portfolio

would help significantly.

practices, and coordinating data collection across Federal Agencie
reduction to improve the quality of Federal statistics, establishing
of the Office of Federal Statistical Policy and Standards, and its
Progress in this direction, at least for BIS. In addition, the revised
reporters, improve estimating methods, and develop more adequate resources

collection so they can fill gaps in current data, identify missing
5. Obvious gaps in the international accounts should be closed. Estimates of increases in foreign holdings of U.S. currency should be included, based on improved Treasury CMIR data and/or a survey of banks involved in incoming and outgoing currency shipments. Problems in the coverage of real estate transactions should be tackled.

6. Efforts by Commerce and Customs to improve the merchandise trade data should continue. Periodic sample audits of shipments through specific ports are useful to identify problem areas, as are efforts to reconcile trade data with other countries.

7. Miscellaneous recommendations to BEA would include a) improving the method used to estimate dividend and interest income on holdings of securities, b) estimating interest receipts and payments on foreign-currency denominated bank deposits, and c) periodically collecting information on the currency composition of accounts receivable and payable between direct investment affiliates and their parents.

8. Miscellaneous recommendations to Treasury would include a) instructing TIC reporters to use tax identification information rather than address to identify foreigners, b) collecting information periodically on the currency composition of banks' foreign currency denominated claims and liabilities, c) improve reporting of banks' write-offs of loans, and d) disaggregate reporting of foreign investments in limited partnerships from purchases of equities and study alternative ways of collecting data on limited partnerships.
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